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LETTERS TO THE EDITOR.

A clock for sending out electric signals once an hour or oftener.

It is necessary that the central clock of a system of controlled clocks should send out an electric signal once an hour, by means of which signal the controlled clocks have their hands set to time.

It is often convenient to have such a clock send out signals oftener than once an hour: for example, at the University of Wisconsin a central clock automatically rings an electric bell in each recitation-room at the end of each hour, and also at ten minutes before the end of the hour, i.e., at fifty minutes and sixty minutes.

There are many ways of accomplishing this end. One of the simplest of these is described below from a clock which is now in use at the Washburn observatory to control by hourly signals a system of secondary clocks in the city of Madison.

The apparatus was made in the University machine-shops by me, and cost, perhaps, five dollars; and it is perfectly satisfactory in its operation. Figs. 1 and 2 represent the projection and section of an ordinary clock-dial, with a ring of black walnut or ebony, *B*, screwed on it.

Around the outer circumference of *B*, and about a quarter of an inch from it, runs the brass wire *C*. This wire is threaded from end to end, and, passing through the four screw-eyes *k*, *k*, is held to, and supported by, the wood ring *B*. The two ends of the wire are joined by means of a long nut, or thimble, *b*. Strung loosely on the threaded ring *C*, and at various points of its circumference, are the small brass nuts *a*, *e*. Some of these are employed as jam-nuts, *a*, *a*, to prevent any tangential motion in the threaded ring. The walnut ring can be made of convenient thickness, so that the minute-hand will pass over it; and for final adjustment the minute-hand may be bent in or out to get the required contact pressure. A thin strip of platinum (*P'*, fig. 3) is soldered to the under side of the minute-hand along the portion which traverses the walnut ring *B*. Around this point is fitted the small block, *I*, of bone or vulcanite, with its under face sloping upward to form a sort of inclined plane to precede the platinum point *P'*. A short piece of platinum wire of suitable size is flattened at one end (*P*, fig. 3); and the flattened part, secured to the small piece of vulcanite, *s*, is laid upon the walnut ring *B*. The other end is bent round the threaded wire *C*, and secured in place by means of the nuts *e* strung on the ring for that purpose.

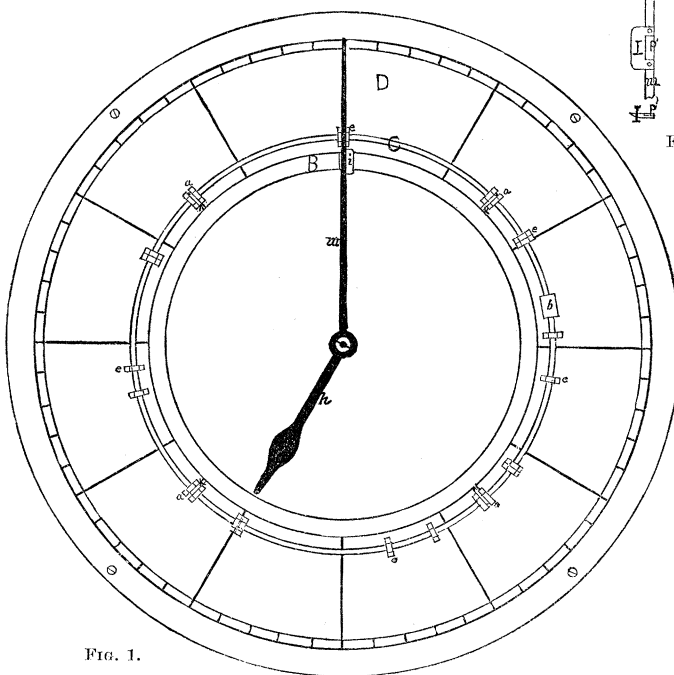


FIG. 1.

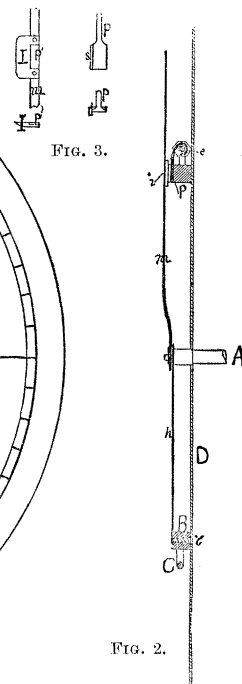


FIG. 2.

FIG. 3.

The points at which the circuit is made and broken are the platinum points *P*, *P'*. The minute-hand, being carried around with its point *P'* in light contact with the ring *B*, is sprung out when the inclined block *I* comes in contact with the projection of *s*; and, being carried along, the points *P*, *P'*, are brought together by the springing-back of the hand. The length of contact depends on the width of the point *P*, and may be varied at pleasure. The circuit-wires are led from the works of the clock and the threaded ring respectively, and may be provided with suitable binding-posts outside the clock. As the ring *C* runs clear around the dial, a platinum point may be inserted anywhere in its circumference; so that any number

of signals may be made during the hour, or those already set may be easily changed. The nuts *e* on the threaded wire not only insure a good metallic contact with the platinum point, but aid materially in its adjustment for a given time of contact. The device is simple, in that it requires no great delicacy of workmanship in its construction, and is of such a form that almost any clock will receive it without change.

H. W. PENNOCK.

Deafness in white cats, and statistics of deafness and epilepsy in America.

In my letter of the 4th inst. (*Science*, iii. 171) I drew attention to the remarkable fact, that white cats, if they have blue eyes, are almost always deaf.

Darwin, in his book on 'Animals and plants under domestication,' attributes the peculiarity to a slight arrest of development in the nervous system in connection with the sense-organs. He thinks there is nothing unusual in the relation of blue eyes and white fur; but in regard to the deafness, he says (ii. 323),—

"Kittens, during the first nine days, whilst their eyes are closed, *appear to be completely deaf*. I have made a great clanging noise with a poker and shovel close to their heads, both when asleep and awake, without producing any effect. The trial must not be made by shouting close to their ears; for they are, even when asleep, extremely sensitive to a breath of air. Now, as long as the eyes continue closed, the iris is no doubt blue; for, in all kittens which I have seen, this color remains for some time after the eyelids open. Hence, if we suppose the development of the organs of sight and hearing to be arrested at the stage of the closed eyelids, the eyes would remain permanently blue, and the ears would be incapable of perceiving sound; and we should thus understand this curious case. As, however, the color of the fur is determined long before birth, and as the blueness of the eyes and the whiteness of the fur are obviously connected, we must believe that some primary cause acts at a much earlier period."

Darwin's conclusion is supported by a remarkable case recorded in France by Dr. Sichel (*Annales sc. nat.*, Zool. 3d series, 1847, viii. 239), in which the iris, at the end of four months, began to grow dark-colored, and *then the cat first began to hear!*

In the human race, also, while it is exceedingly problematical how far congenital deafness is associated with a deficiency of coloring-matter in the skin and hair, it appears, according to Darwin ('Animals and plants under domestication,' ii. 322), that some relation exists between various affections of the eyes and ears.

He states that Liebrich found, upon examining the eyes of 241 deaf-mutes in Berlin, that no less than fourteen suffered from the rare disease called pigmentary retinitis. He also states, upon the authority of Mr. White Cooper and Dr. Earle, that color-blindness is often associated with a corresponding inability to distinguish musical sounds.¹

I have already shown that the census returns for 1880 indicate that the proportion of deaf-mutes among our colored population is much less than among the whites; but private inquiry at the census bureau seems to show that the proportion of *congenitally* deaf among the colored deaf-mutes, instead of being less, is very much greater, than among the white deaf-mutes.

Of 19,475 white deaf-mutes, 10,738 (or 55 per cent) were stated to have been born deaf, and 8,737 (or 45 per cent) were returned as deaf from disease or accident: on the other hand, of 1,751 colored deaf-mutes, 1,301 (or no less than 74 per cent) were reported as congenitally deaf, and only 450 (or 26 per cent) as deaf from disease or from accidental causes.

By the kindness of Gen. Seaton, I am enabled to give the following unpublished figures from the census returns bearing upon the point:—

Number of deaf-mutes in the United States, living June 1, 1880, arranged according to race and sex.

CAUSES OF DEAFNESS.	Colored.		Foreign white.		Native white.		TOTAL.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Congenital . . .	714	587	545	444	5,229	4,520	6,488	5,551
Injury to ear . .	7	2	8	2	34	17	49	21
Disease of ear . .	7	8	10	7	204	166	221	181
Other diseases . .	178	147	306	252	4,172	3,368	4,656	3,767
Miscellaneous . .	73	28	81	77	610	423	764	528
Not stated . . .	..	..	..	..	..	..	6,389	5,263
Totals	979	772	950	782	9,249	8,494	18,567	15,311

¹ These statements are taken from Mr. Sedgwick, in the *Medico-chirurg. review*, July, 1861, p. 198; April, 1863, pp. 455 and 458. Liebrich is quoted by Professor Devay in his 'Mariages consanguins,' 1862, p. 116.

In my former communication I quoted from Dr. Lawson Tait's paper on 'Deafness in white cats' (*Nature*, xxix. 184) the following remarkable statement: "Every kind of white animal I have kept as a pet has proved to be the subject of epilepsy; and the association is suggestive, when we are told, as I have been frequently, that the disease is unknown among negroes."

I presume that Dr. Tait must have referred to the negro in his native habitat; for I find, upon inquiry at the census bureau, that epilepsy appears to be more common among the colored people of America than among the whites. I am indebted to the courtesy of Gen. Seaton for the following unpublished figures from the tenth census:—

Percentage of epileptics in the United States, 1880, by race and sex.

White male . . . . .	.004749
White female . . . . .	.003751
Black male . . . . .	.005011
Black female . . . . .	.004267
Indian male . . . . .	.002942
Indian female . . . . .	.003084
Chinese male	—
Chinese female . . . . .	.020925

These results will doubtless be of interest to your readers.

ALEXANDER GRAHAM BELL.

Washington, D.C., Feb. 29, 1884.

In a letter to *Science* of Feb. 15, Prof. A. G. Bell quotes from Dr. Lawson Tait, that "every kind of white animal I have kept as a pet has been the subject of epilepsy; and the association is suggestive when we are told, as I have been frequently, that the disease is unknown among negroes." This remark in regard to the negroes, I know, cannot be entirely true. I am a southern-born man; and I have seen a great deal of negroes all my life, and have always considered that epilepsy prevailed among them, even to a greater extent than among white people. I can easily give a number of instances of its occurrence, coming under my own observation and that of my friends to whom I have mentioned the subject.

Georgetown, D.C., Feb. 21, 1884.

BENJ. MILLER.

The Krakatoa eruption.

The council of the Royal society has appointed a committee for the purpose of collecting the various accounts of the volcanic eruption at Krakatoa, and attendant phenomena, in such form as shall best provide for their preservation, and promote their usefulness.

The committee invite the communication of authenticated facts respecting the fall of pumice and of dust, the position and extent of floating pumice, the date of exceptional quantities of pumice reaching various shores, observations of unusual disturbances of barometric pressure and of sea-level, the presence of sulphurous vapors, the distances at which the explosions were heard, and exceptional effects of light and color in the atmosphere. The committee will be glad to receive, also, copies of published papers, articles and letters, bearing upon the subject.

Correspondents are requested to be very particular in giving the date, exact time (stating whether Greenwich or local), and position whence all recorded facts were observed. The greatest practicable precision in all these respects is essential.

All communications are to be addressed to

G. J. SYMONS,

Chairman Krakatoa committee.

Royal society, Burlington House,
London, Feb. 12, 1884.